WHAT IS CLAIMED IS:

1. A lithographic projection assembly, comprising:

a radiation system configured to provide a beam of radiation;

a support structure configured to support a patterning device that imparts a desired pattern onto said beam of radiation;

a substrate holder configured to hold a substrate;

at least two load locks for transferring said substrate between a first environment and a second environment, said second environment configured to have a lower pressure than said first environment;

a lithographic projection apparatus comprising a projection chamber in which said substrate is processed by projecting said patterned beam onto a target portion of the substrate; and

a substrate handler comprising a handler chamber in which said second environment prevails, said handler chamber and said projection chamber communicate via a load position for inputting said substrate from said handler chamber into said projection chamber and an unload position for removing said substrate from said projection chamber into said handler chamber, said handler chamber comprising:

a pre-processing system configured to perform pre-processing tasks on said substrate prior to being processed in said projection chamber; and

a transport system configured to transfer said substrate from said load locks to said pre-processing system, transfer said substrate from said pre-processing system to said load position, and transfer said substrate from said unload position to said load locks.

2. The lithographic projection assembly according to Claim 1, wherein said projection chamber is a vacuum chamber and said lithographic projection apparatus comprises vacuum means for establishing or maintaining a vacuum in the vacuum chamber.

3. The lithographic projection assembly according to Claim 1, wherein said pre-processing system comprises a pre-alignment mechanism configured to pre-align said substrate.

4. The lithographic projection assembly according Claim 1, wherein said transport system comprises a single manipulator provided with a first gripper and wherein said lithographic projection assembly comprises a control mechanism adapted to control said gripper to (a) pick up said substrate from one of said load locks and transfer to said pre-processing system, (b) to pick up said substrate from said pre-processing system and transfer to said load position, and (c) pick up said substrate from said unload position and transfer to one of said load locks.

5. The lithographic projection assembly according to Claim 1, wherein said transport system comprises a first manipulator provided with a first gripper, and a second manipulator provided with a second gripper, and wherein said lithographic projection assembly comprises a control mechanism adapted to control said first and second manipulators to (a) pick up said substrate with the first gripper from one of said load locks and transfer to said pre-processing system, (b) pick up said substrate with the second gripper from said pre-processing system and transfer to said load position, and (c) pick up said substrate with the first gripper, from said unload position and transfer to one of said load locks.

6. The lithographic projection assembly according to Claim 5, wherein at least one of said first and second grippers is provided with a thermal treatment mechanism configured to perform at least one of bringing said substrate to a predetermined temperature, equalizing the temperature across said substrates, and conditioning the temperature of said substrate.

7. The lithographic projection assembly according to Claim 5, wherein said at least two load locks comprise a first and a second load lock and said first or second manipulator is positioned in order to co-operate with both said first and said second load locks.

8. The lithographic projection assembly according to Claim 1, wherein each of said first and second load locks are formed as a two-way load lock.

9. The lithographic projection assembly according to Claim 1, wherein each of said first and second load locks are provided with first and second substrate support positions.

10. The lithographic projection assembly according to Claim 1, wherein said first and second load locks are connected to a substrate track for supply and removal of substrate to and from said first and second load locks.

11. The lithographic projection assembly according to Claim 1, further comprising a third load lock for transferring objects from a third environment to a second environment, said third load lock being freely accessible from a side facing said third environment.

12. The lithographic projection assembly according to Claim 11, wherein said control mechanism is configured to (a) place said substrate into said third load lock, (b) keep an external door of said third load lock closed while said placed substrate is in said third load lock, and (c) pick up and transfer said placed substrate after having transferred other substrates with said transport mechanism.

13. The lithographic projection assembly Claim 1, wherein at least one of said at least two load locks comprises a side door for transferring objects from a fourth

environment to said second environment, said side door facing the fourth environment and being freely accessible.

14. The lithographic projection assembly Claim 4, wherein said control mechanism is adapted to control said load locks independently of each other.

15. The lithographic projection assembly Claim 1, wherein said pre-processing system is provided with a thermal treatment mechanism configured to perform at least one of bringing said substrates to a predetermined temperature, equalizing the temperature across said substrates, and conditioning the temperature of said substrates

16. The lithographic projection assembly Claim 1, wherein said substrate comprises a semiconductor wafer.

17. A lithographic substrate handler assembly, comprising:

at least two load locks for transferring a substrate between a first environment and a second environment, said second environment configured to have a lower pressure than said first environment; and

a substrate handler comprising a handler chamber in which said second environment prevails, said handler chamber and a next station communicate via a load position for inputting said substrate from said handler chamber into said next station and an unload position for removing said substrate from said next station into said handler chamber, said handler chamber comprising:

a pre-processing system configured to perform pre-processing tasks to treat said substrate prior to being processed; and

a transport system configured to transfer said substrate from said load locks to said pre-processing system, transfer said substrate from said pre-processing system to said load position, and transfer said substrate from said unload position to said load locks.

18. The lithographic substrate handler assembly of Claim 17, comprising a track and said at least two load locks being arranged between said track and said substrate handler.

19. A method of handling a lithographic substrate, comprising:

a) transferring a substrate from a first environment into one of at least two load locks through an external door of said load lock;

b) closing said external door and evacuating said one load lock;

c) opening an internal door of said load lock;

d) picking said substrate from said load lock with a first manipulator and transferring said substrate with said first manipulator to a pre-processing system;

e) treating said substrate under said pre-processing system;

f) picking said substrate from said pre-processing system with said first manipulator or a second manipulator;

g) transferring said substrate picked up from said pre-processing system with said first or second manipulator to a load position;

h) treating said substrate and delivering said substrate to an unload position;

i) picking said substrate from said unload position with said first manipulator and transferring said substrate through the internal door into said load lock or an internal door of another load lock;

j) closing said respective internal door and venting said respective load lock; and

k) opening said respective load lock and removing said substrate from said respective load lock.

20. The method of Claim 19, further comprising thermally treating said substrate prior to said opening an internal door.

21. The method of Claim 19, wherein said treating said substrate comprises at least one of thermally treating said substrate and pre-aligning said substrate.

22. The method of Claim 19, wherein said picking up said substrate from said load lock is executed with respect to one load lock, while at least one of said transferring said substrate from a first environment, said closing said external door, said opening an internal door, said closing said the respective internal door, and said opening said respective load lock are executed with respect to another load lock.

23. The method of Claim 19, wherein said substrate being a semiconductor wafer.

24. A method of operating a lithographic projection assembly including a substrate handler with one or more load locks, said method comprising:

a pump down cycle in which said at least two load locks have pressure in a respective load lock reduced;

a vent cycle in which said pressure in a respective load lock is increased;

a startup mode wherein at least one of said at least two load locks performs said vent cycle without a substrate being present in the respective load lock, while the respective load lock performs the pump down cycle with a substrate being present in the respective load lock;

a normal operation mode wherein at least one of said at least two load locks performs said pump down cycle as well as said vent cycle with a substrate being present in the respective load lock;

a run empty mode wherein at least one of said at least two load locks performs said pump down cycle without a substrate being present in the respective load lock, while the respective load lock performs said vent cycle with a substrate being present in the respective load lock.

25. The method of Claim 24, wherein at least one of said startup mode, said normal operation mode, and said run empty mode are repeated based on events occurring during processing of substrates.

26. The method of Claim 24, wherein at least one of said load locks is provided with a first and second substrate support position.

27. The method of Claim 24, wherein said load locks comprise two load locks each having at least one substrate support position.

28. A lithographic projection assembly, comprising:

one or more load locks for transferring substrates between a first environment and a second environment, said second environment having a lower pressure than said first environment, wherein at least one of said load locks is provided with a first and a second substrate support position;

a substrate handler comprising a handler chamber in which said second environment prevails;

a lithographic projection apparatus comprising a projection chamber to process said substrates;

wherein said handler chamber and said projection chamber communicate through a load position for inputting said substrates from said handler chamber into said projection chamber and an unload position for removing said substrates from said projection chamber into said handler chamber; and

wherein said handler chamber is provided with pre-processing system for treating said substrates prior to being processed in said projection chamber and a transport system configured to transfer said substrates from said load locks to said pre-processing system, from said pre-processing system to said load position, and to transfer said substrates from said unload position to said load locks.